Post-permit Considerations

POST-PERMIT CONSIDERATIONS

POST-PERMIT CONSIDERATIONS

The section **Maintenance of Surface Water Management Systems** lists typical system components and provides some very generalized guidance on the maintenance of each one.

A section on the long-term **Management and Maintenance of Environmental Areas** is included to assist permittees with post-permit compliance issues associated with wetland preservation and mitigation areas.

A copy of the ***Environmental Monitoring Report Guidelines*** is included for ease of reference. This document has been in use for several years throughout the District and provides guidance for permittees in conducting wetland monitoring programs which have been required as a condition of an Environmental Resource Permit.

Maintenance of
Surface Water Management Systems

MAINTENANCE OF SURFACE WATER MANAGEMENT SYSTEMS

The efficiency of a surface water management system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. The following is a list of maintenance items that should be performed as necessary in order to ensure that the surface water management system operates as designed. This list, or one similar in nature, should be given to the property/homeowners association at the time they accept responsibility for operation and maintenance of the surface water management system.

SWALES

Once a grassed swale has been constructed properly, the only routine maintenance required is mowing. Additional work may be required since it is normal for the bottom of the swale to fill in slowly over time due to the accumulation of particulate matter settling out of the stormwater runoff. The centerline elevation of the swale should be maintained no higher than the minimum elevation of any upstream driveway aprons through the swale.

The optimum time to inspect the grade of a swale is during a rainfall event immediately after the swale has been mowed. If the swale bottom is too high, it can cause water to be ponded upstream. Water can also accumulate if the bottom of the swale is significantly lower than the elevation of any downstream aprons. Ponded water is not necessarily bad, unless soil conditions hinder percolation. If percolation is poor, swale maintenance is critical for proper operation of the drainage system.

Certain common practices can actually accelerate the need for swale maintenance. When a swale is planted with trees and shrubs, the plantings can impact the treatment volume and the rate of flow. Shrubs and trees placed in swales should be along the swale edges as opposed to along the centerline.

In many areas, individuals park vehicles within the swales. This practice can be detrimental in several ways. Petroleum products leaking from motor vehicles parked in swales can enter the water management system. If the grass dies from exposure to these products, soil erosion can result. Eroded areas should be resodded as soon as possible. In addition to contamination, the weight of a vehicle can alter the grade of the swale if the ground is saturated. If this occurs, the proper grade can usually be easily reestablished while the ground is still soft.

STORMWATER INLETS

Most stormwater inlets are fitted with a grate to prevent the introduction of debris into the stormwater pipe system. The grates should be inspected periodically and any accumulated debris removed. Over a period of time, sediment can build up within the bottom of inlet structures. If the sediment is not removed, it can migrate into the pipe system. Sediment can be easily removed from the inlet structure, but once it begins to build up in the pipe system, flushing or vacuuming may be required in order to remove it.

DETENTION/RETENTION AREAS

All pipe entrances and exits should be inspected to ensure that they are not buried beneath debris, soil or vegetation. Any blockages should be removed. If any bare soil is exposed, it should be stabilized (such as with sod, etc.) to prevent erosion. Dry water management areas should be mowed regularly. Water control structures should be inspected to ensure that any v-notches, slots, orifices or other control devices are not blocked by debris.

CULVERTS

The ends of culverts need to remain clear of blockages. If the culvert is crushed, it should be restored to original dimensions. Corrugated metal pipe culverts can rust over time. This is usually evident by the creation of a small depression immediately above the faulty pipe. The depression is caused by soil falling into the pipe. If the depression is filled, it will continue to reappear. When this situation occurs, the pipe should be excavated and repaired or replaced, depending on the extent of the corrosion.

OUTFALL STRUCTURES

Each outfall structure (also called the discharge control structure) and associated baffles or other trash collectors should be periodically inspected to ensure it is neither blocked by debris nor in need of repair. Any blockages should be removed. Structure elevations and dimensions should be annually compared to current permit information and restored to permitted conditions if needed.

(THIS SECTION RESERVED)

Management and Maintenance of Environmental Areas

MANAGEMENT AND MAINTENANCE OF ENVIRONMENTAL AREAS

After a project has been permitted and constructed with a designated environmental preserve area, that area will need to be managed and maintained. Environmental preserve areas may consist of wetland preservation areas, upland buffers, upland preservation areas, wetland mitigation areas, or a combination of these. The management and maintenance needs of environmental areas are not so different from other grounds or landscaped areas within the project, except that the maintenance will likely be much less frequent.

Management Plans

Often a permitted project is turned over to an operating entity other than the original permittee. The permit may require that monitoring reports on mitigation areas be submitted for a specified period of years, that exotic or nuisance vegetation be removed, that a minimum coverage of wetland vegetation be maintained, or that other special conditions be met during the phase of the project for which the operating entity will be responsible. The operating entity should be advised of all permit requirements and financial responsibilities associated with the environmental preserve areas which remain in effect during the operation phase of the project.

It is wise to develop an overall management plan for the preserve areas in the same manner as plans are developed for the maintenance of any common grounds or landscaped areas. Preserve area management plans should specify the responsible entity for implementing the management plan and list all management and maintenance requirements of the environmental preserve areas. These requirements should be clearly spelled out for the operating entity and become a part of any property owners association documents. A management plan that is properly implemented will help to ensure that the project stays in compliance with the permit and special conditions, and help to prevent future problems due to a lack of understanding of the operating entity's responsibilities.

Maintenance

Preserve areas should be kept free from undesirable exotic and nuisance vegetation (such as those listed by the Exotic Pest Plant Council) which may appear over time or encroach from adjacent lands. Landscapes which contain exotic or nuisance vegetation will likely be a continual seed source of unwanted vegetation. If the seed source is not eliminated, it will continue to present a problem for the preserve area and be a continual maintenance issue.

Preserve areas should be kept free of trash and debris. There is a tendency for some people to use open areas, including preserve areas, as dumping grounds for yard trimmings and debris. Sometimes land owners do not know that an area within or adjacent to their property has been designated as an environmental preservation area. Property owners should be notified of the locations or boundaries of all environmental preserves and instructed in the types of activities that can and cannot be conducted there. Posting signs which indicate the

location of preserve areas is a simple and convenient method to reduce encroachment into the preserve areas. Figure PD-1 shows a typical preserve area notification sign and the placement at the preserve boundary

Conservation Easements

When an environmental preserve area is designated as a conservation easement, there are legal restrictions imposed on the activities that can be conducted within the boundaries of the easement. The restricted activities are specified in Subsection 704.06(1), F.S., and are as follows.

"(a) Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground;
(b) Dumping or placing of soil or other substance or material as landfill or dumping or placing of trash, waste, or unsightly or offensive materials;
(c) Removal or destruction of trees, shrubs, or other vegetation;
(d) Excavation, dredging, or removal of loam, peat, gravel, soil, rock or other material in substance in such manner as to affect the surface;
(e) Surface uses except for purposes that permit the land or water area to remain predominantly in its natural condition;
(f) Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation;
(g) Acts or uses detrimental to such retention of land or water areas; and
(h) Acts or uses detrimental to the preservation of the structural integrity or physical appearance of sites or properties of historical, architectural, archaeological, or cultural significance."

Environmental Education

Educational brochures, management plans incorporated into association documents, posted signs and the promotion of activities compatible with environmental purposes are useful tools in ensuring compliance with the permit conditions. When the preserve is promoted as an area for observing and photographing wildlife, enjoying the aesthetics and quiet of a natural area, watching butterflies, birding, hiking on nature trails, or other passive recreational activities, it becomes an attraction to be protected.

Providing information to operating entities and property owners via association documents on the types of activities that are permitted and are not permitted in the preserve is important. Notification and education can go a long way toward ensuring the long-term integrity of environmental preserve areas. If the areas are clearly identified, and if efforts are made to educate property and project owners about the importance of the preserve areas, compliance with the Environmental Resource Permit is much more likely.

Post Construction Measures to Prevent Impacts to Wetlands

Use of Signs to Notify Property Owners of Preserve Boundaries

PRESERVE BOUNDARY LINE

No alterations permitted to soil, vegetation or water.

Environmentally Sensitive Area

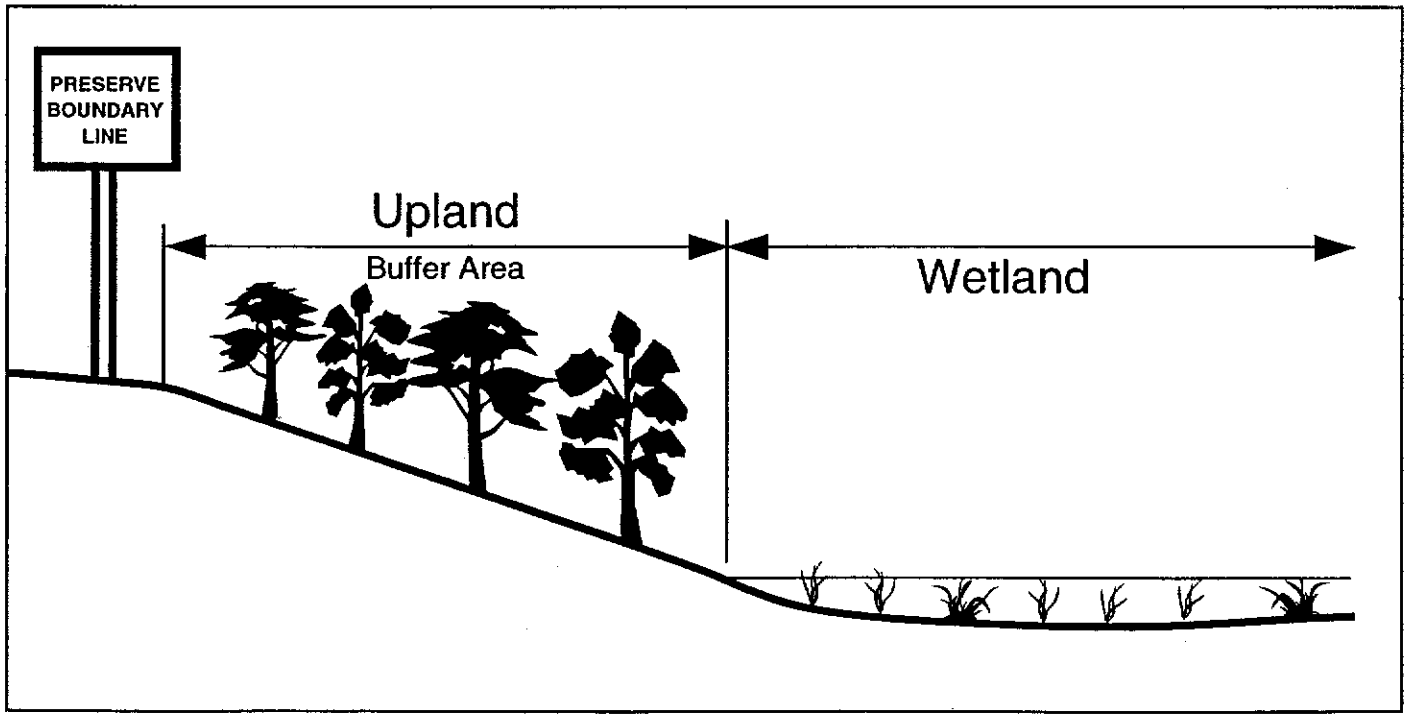


Figure PD-1

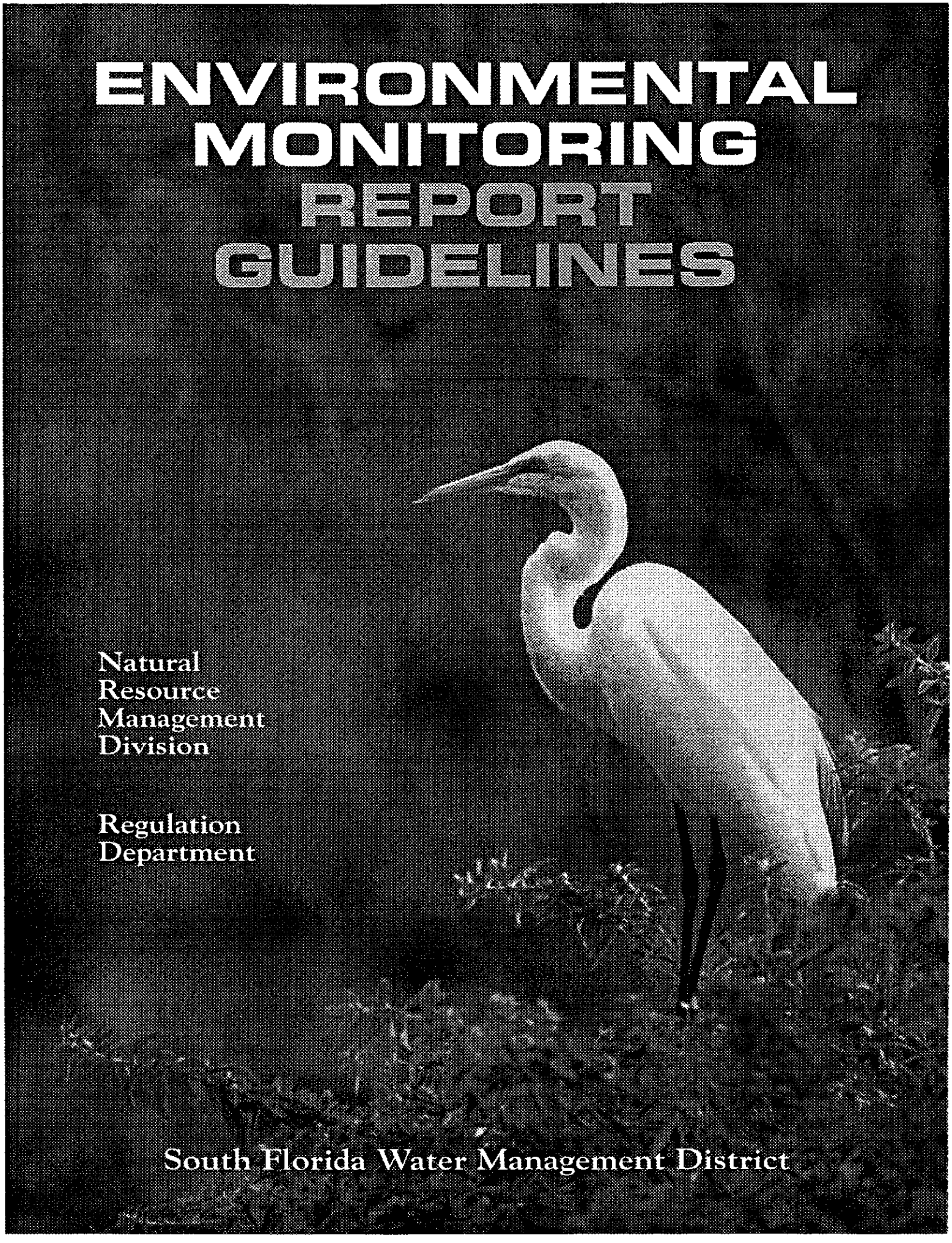
Environmental Monitoring Report Guidelines

INTRODUCTION TO *ENVIRONMENTAL MONITORING REPORT GUIDELINES*

As part of the reasonable assurance that a project with wetland mitigation or preservation will be successful, a permittee will likely be requested to monitor environmental areas within a permitted project. These monitoring requirements are requested pursuant to the *Basis of Review for Environmental Resource Permit Applications,* Section 4.3.4. Submittal of a proposed monitoring plan will typically be requested during the permit application review process. The permit special conditions will specify the length of time and frequency of monitoring for each project requiring environmental monitoring.

The following document contains both the District's recommended guidelines for preparing monitoring reports for environmental areas, and descriptions of the type of information necessary in order to ascertain the compliance status of a project. The guidelines, which have been used for several years throughout all areas of the District, are included here to assist permittees and their consultants in conducting monitoring events and in preparing the reports which are submitted to the District.

ENVIRONMENTAL MONITORING REPORT GUIDELINES



Natural
Resource
Management
Division

Regulation
Department

South Florida Water Management District

TABLE OF CONTENTS

PURPOSE

The development of these guidelines were initiated to establish accurate and consistent monitoring report guidelines for the South Florida Water Management District and to provide a standardized report format for the public. Specifically, the report guidelines provide:

- Standardized format which will allow for consistency in reviewing data
- Simplified entry of data into the District's post-permit compliance database
- Useful and consistent information that can be used in determining compliance status and overall success of mitigation projects

Additional enhancements will be added in the future that will provide efficient processing of monitoring reports. One of these enhancements will include the electronic submittal of monitoring reports by permittees.

TYPICAL COVER PAGE

Environmental Monitoring Report

Project name

Permit Number

County, Section, Township & Range

Permittee

Report Number

Date Submitted

Consultant

Consultant Telephone Number

INTRODUCTION

Project Objective (including pertinent environmental special conditions):

Permit Number, Application Number and Issue Date:

Project Construction Schedule:

Monitoring Report Schedule:

SITE LOCATION AND DESCRIPTION

Figure 1. Site Location Map

Map showing specific location and location in relation to regional features (i.e. roads, canals, etc.)

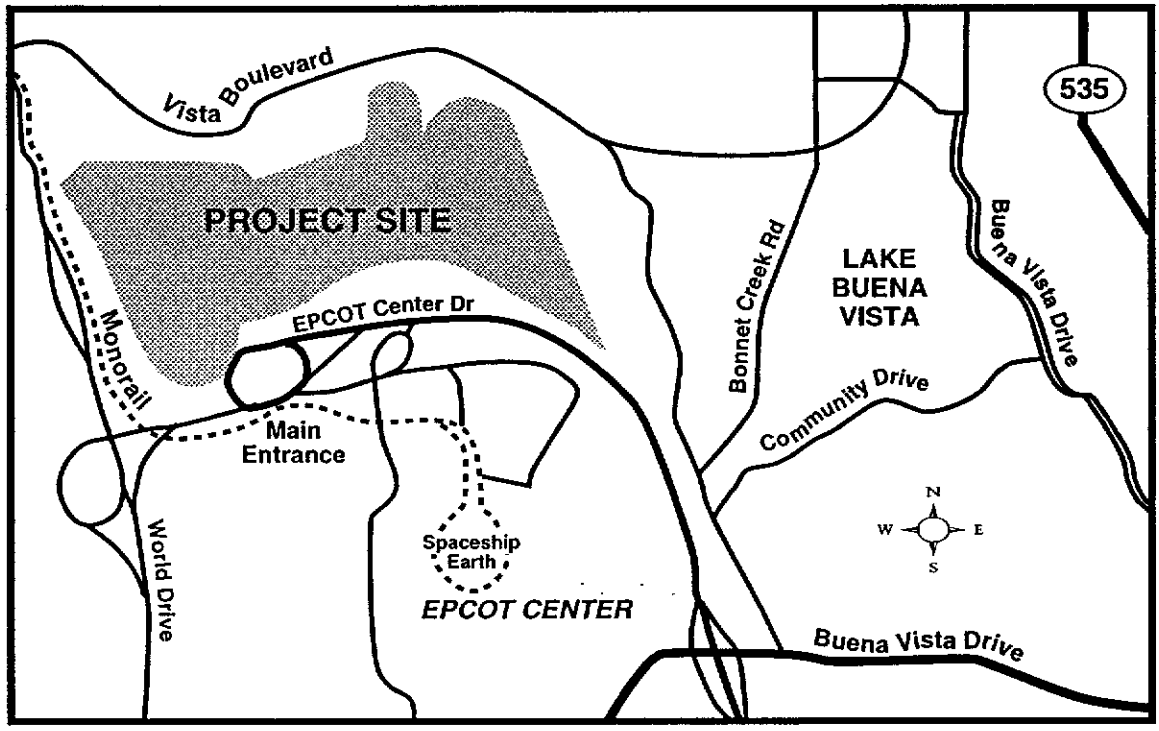
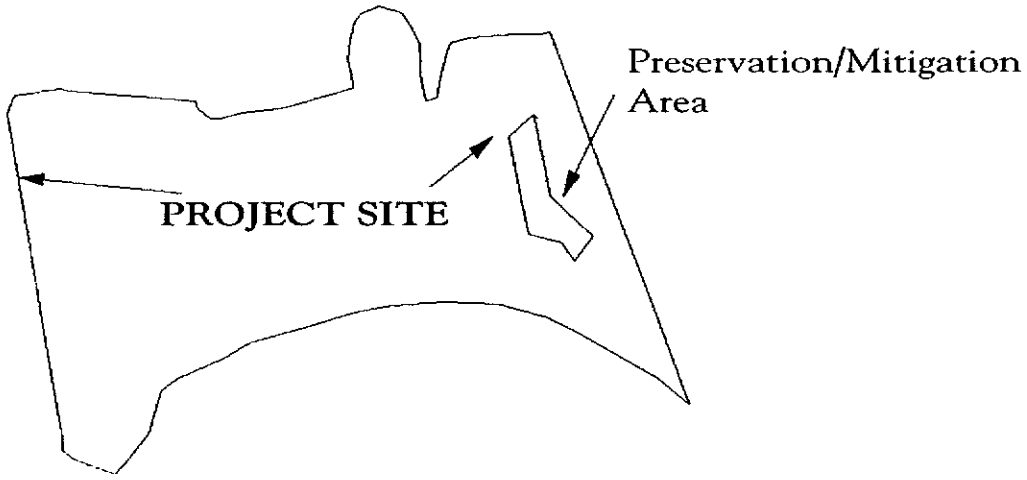


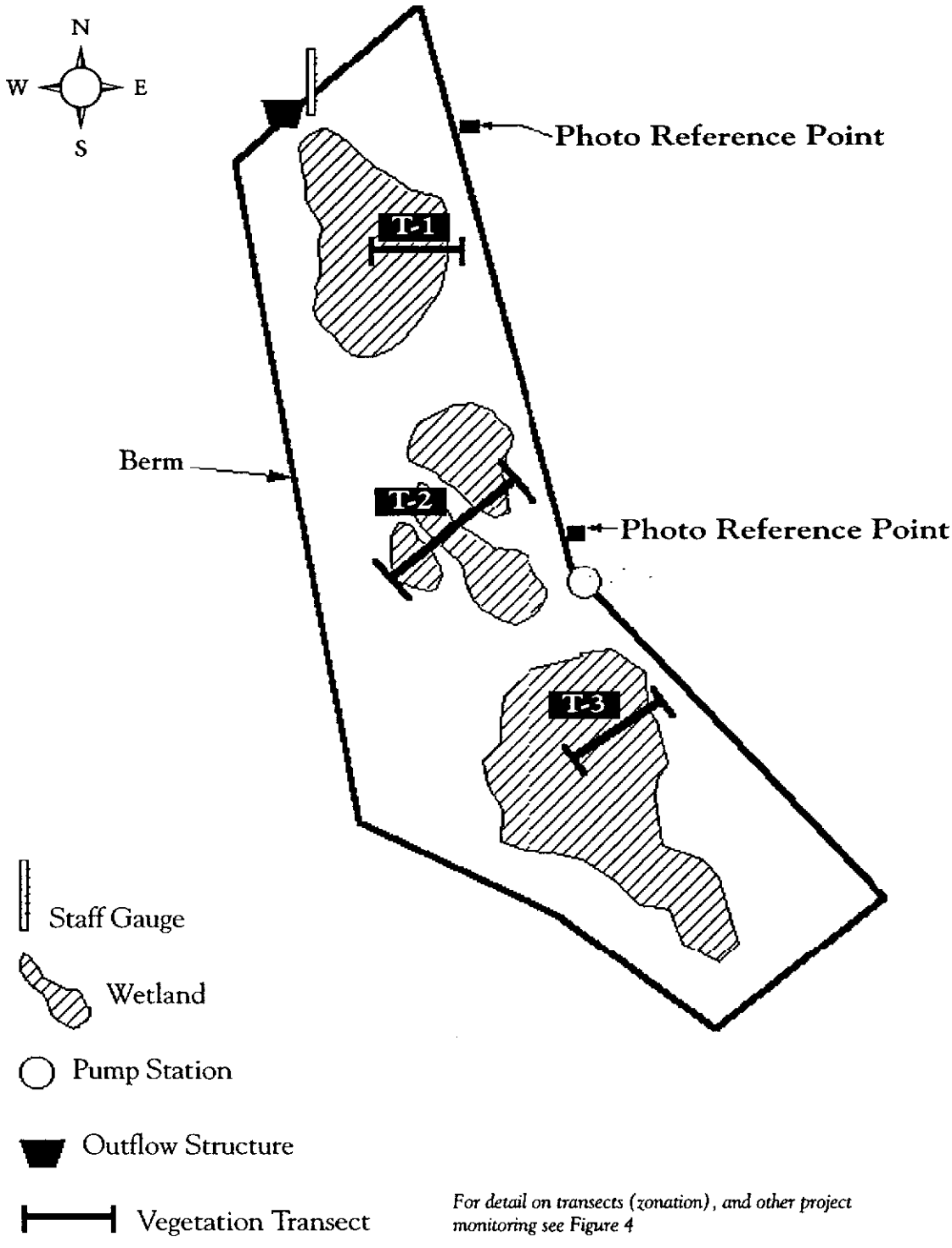
Figure 2. Detailed Site Map

Map showing location of wetland within project.



FIELD SAMPLING DESIGN

Figure 3. Typical Wetland Area Monitoring Layout (Example shows agriculture application.)



For detail on transects (zonation), and other project monitoring see Figure 4

Figure 4. Wetland Plan View showing location of transect through wetland areas to be monitored. (Location of rain gauge, and staff gauge(s) should be provided with each report, where applicable):

Note: For an example of a cross-sectional view see Figure 5

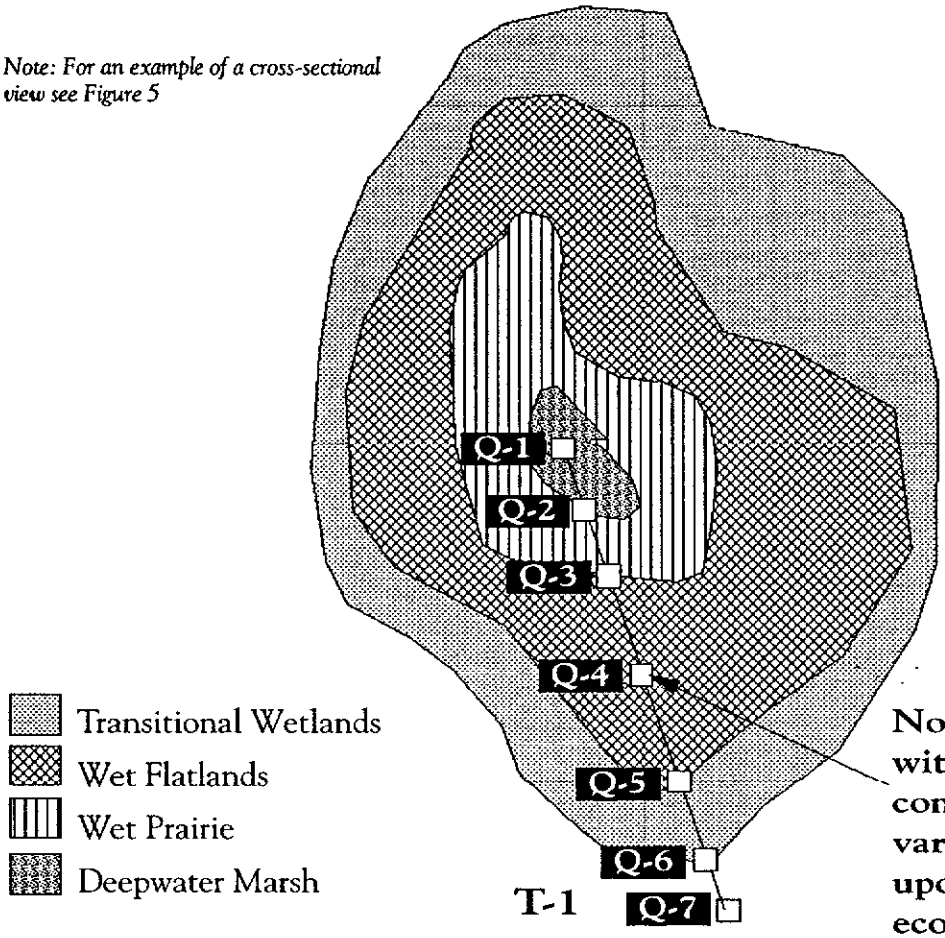
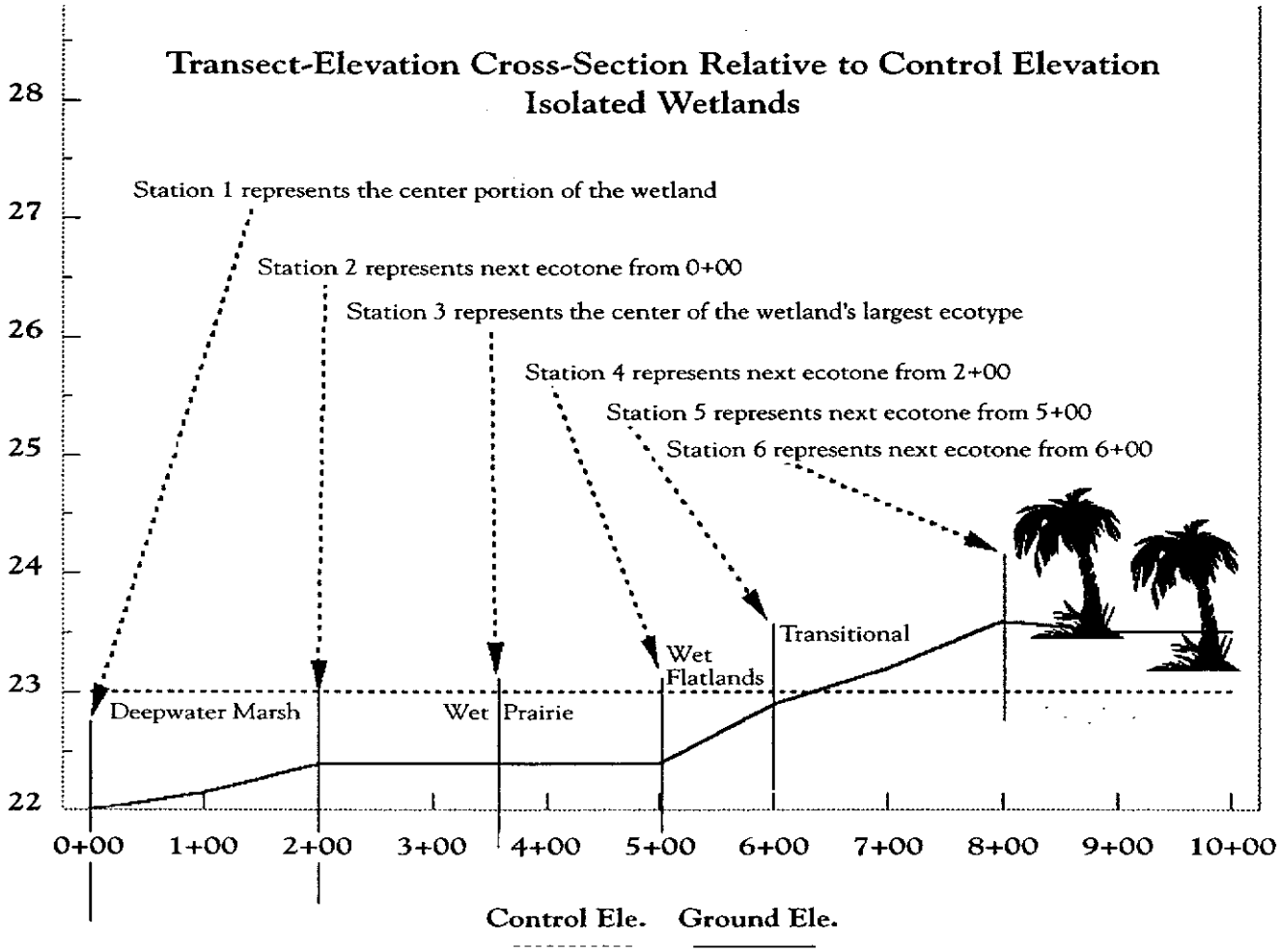


Table applies for each wetland and quadrat to be monitored.

Wetland "X"	Baseline	1st Annual	2nd Annual	3rd Annual	4th Annual	5th Annual
			COVERAGE			
T1-Q1						
Spp.1	%	%	%	%	%	%
Spp.2	%	%	%	%	%	%
Spp.3	%	%	%	%	%	%
Spp.4 (etc.)	%	%	%	%	%	%
T1-Q2 (etc.)						

Comments for Wetland "X": Comments should reflect overall condition of the wetland for each reporting period.

Figure 5. Transect-Elevation Cross-Section Relative to Control Elevation of Wetlands



SAMPLING METHODOLOGY

Each quadrat along the transect should be sized based on the type of community encountered within that ecotone. For example, a quadrat for a mature hardwood swamp should be considerably larger than a wet prairie. Size, location and number of quadrats should remain consistent through all monitoring reports.

Plant species should be categorized by:

*Dominant Species - Composition of 80% or greater
*Other Species - <20% Coverage
*Significant Indicator Species - Individuals or %

Additional Guidelines:

- Transect Stations should be set up from 0+00 to infinity, going from center of wetland out.
- Quadrats should be sized to accurately reflect the community type.
- Report should include survivorship data for planted tree species.
- Individual strata coverage should not exceed 100%

General Description of site condition:

- Land Use, adjacent land use, etc.

Unless specified otherwise by the permit conditions, sampling should be conducted, semiannually (April/May and Sept/October) and reports submitted annually.

Vegetation Sampling

Transect location and Length:
No. of Stations:
Percent Cover calculation methodology:
Community Types or Ecotones:
Water depth at each Station:

Detail: Each vegetative community type should be represented in transect(s). Establish one station at each interface to each ecotone. Depending on the width of the ecotone, intermediate stations may need to be established. Document natural ground elevation at each station. Vegetative species that may indicate shifts in community types (including exotic or invasive plant species) should also be noted. The same transects and stations should be used for all monitoring. Provide Common name, Genus and Species for each.

* *With a breakdown of each species & % coverage*

Photographic Documentation

Date stamped quality photographs should be taken at fixed stations at 90 degrees to the transect. For larger wetlands, panoramic photographs are required. Photographs should be taken during both sampling events.

Aquatic Macrofauna Sampling

Fish (summary):
Macro-invertebrates (summary):
(Include fish and macroinvertebrate tables in appendix)

Detail: Qualitative samples of small forage fishes and aquatic macroinvertebrates (if requested) should be obtained with a dip net, throw net, traps or small seine from inundated portions of the wetland at each habitat category or zone along transect (minimum 2 samples) to document the presence and relative abundance of food chain organisms. Identification to species level for macroinvertebrates and fishes. Macroinvertebrate data collected at the beginning and end of wet season and submitted with monitoring reports.

Fish and Wildlife Observations

Observation type: (i.e. observations, roosting, calls, rooting, rubs, scats & tracks). Observation should be site specific. Utilization of the area by wading birds and other organisms higher in the food chain.

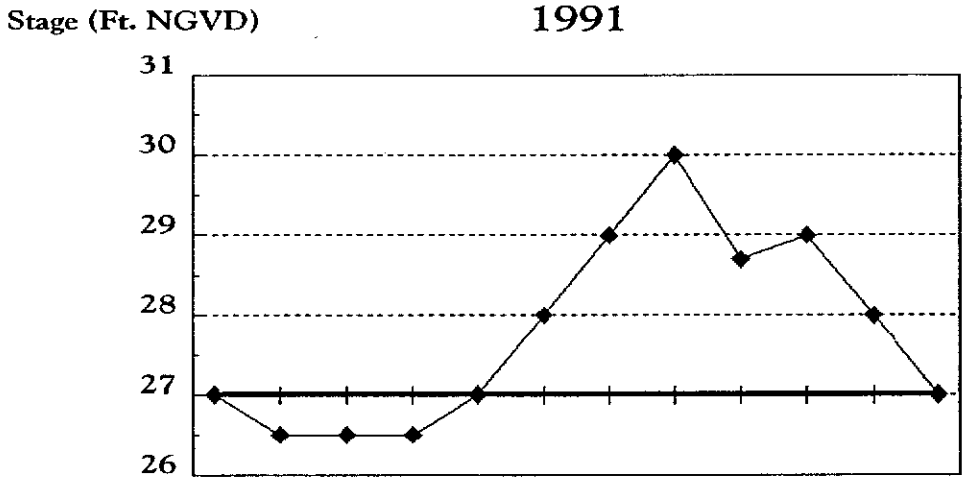
Detail: Provide table in appendix by Common Name, Genus and Species.

Hydrology

Source: (i.e. Rainfall, Surface Water, Pump System, Groundwater)
Total Monthly Rainfall: Rain Gauges should be located on project site or close proximity to site and recorded on a weekly basis (minimum)
Staff Gauge(s) should be located near the water control structure and set to NGVD (at base of staff gauge - Weekly readings)
Hydrographs: See figure 6 (only associated with those projects with control elevations)

Detail: Rainfall should be recorded on a weekly basis with the total monthly provided in the report.

Figure 6. Annual Stage/Rainfall Hydrograph



MONTH	J	F	M	A	M	J	J	A	S	O	N	D
Control Elevation +	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Water Elevation ◆	27.0	26.5	26.5	26.5	27.0	28.0	29.0	30.0	28.7	29.0	28.0	27.0

For illustration purposes only

Results and Discussion

The results and discussion section should provide a summary of the overall data (i.e. Vegetation, Aquatic Macrofauna, Wildlife and Hydrology, if applicable). Summary should indicate vegetative coverage % of species across entire transect(s). If applicable, survivorship data should be submitted for planted tree species. Summary may also be broken down into the community types or ecotones. Provide an overall summary of site conditions.

Project Maintenance: Wetland maintenance methodology should be submitted with the baseline report* or with the time-zero report upon completion of the mitigation objective (creation, restoration, enhancement or preservation). The plan should address removal of exotic and nuisance plant species (total eradication of exotic plant species and minimum of 10% of all nuisance plant species) and assure an 80% coverage or appropriate survival rate for planted or recruited species. An evaluation of the success of the maintenance effort must be conducted and discussed in the monitoring report. Report should discuss any remediation efforts implemented to bring the project into compliance.

* *Baseline Report - Monitoring conducted prior to construction*
Time Zero Report - Monitoring conducted after completion of initial mitigation planting

Appendix 1. Water Level Reading Table (NGVD)

Weekly Water Level Data (Example)

1994 Wetland1-Staff Gauge 1

June 7 .....25.36
June 14 .....25.82
June 21 .....25.91
June 28 .....28.89

Wetland1-Staff Gauge 1

July 5 .....27.05
July 12 .....26.36
July 19 .....27.15
July 26 .....27.06

Wetland1-Staff Gauge 1

Aug 2 .....27.00
Aug 9 .....28.85
Aug 16 .....28.80
Aug 23 .....28.20
Aug 30 .....28.15

Appendix 2. Example of Photo Station

Photo date and time:
Transect or Photo point ID:
Direction: